

EMI TEST REPORT

Test report no. : ERI-FCC-0126

Type of equipment : MP3 PLAYER

Model no. : CA-1000

Applicant. : CM Tech Co., Ltd.

Test standards : FCC Part15 Subpart B (Class B)

Test procedure and items

- AC power line conducted emissions measurement : ANSI C63.4-1992
- Radiated emissions measurement : ANSI C63.4-1992

Test result : **PASS**

This equipment has been tested to comply with the requirements of FCC rules and regulations part 15 subpart B unintentional radiators.

The results in this report apply only to the sample tested.

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Date of test: 2002. 7. 2 – 7.3

Issued date: 2002. 7. 4



Tested by :

GWEON, HUR



Approved by:

SANG-KYU, LEE

This laboratory is registered by KOLAS, KOREA.

This test report have been performed in accordance with its terms of registration.

66-6, JEIL-RI, YANGJI-MYUN, YOUNGIN-CITY, KYUNGGI-DO, KOREA

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1. Client information

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2. Laboratory information

Address

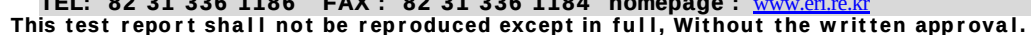
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All of the test facilities of ERI were accredited by KOLAS(ATS) / MIC of Korea,
FCC.

KOLAS No. : 111
EK : J
MIC : KR0030
FCC Filing No. : 302567

The map shows the Yangguri River flowing through the Yongin area. A red arrow points to a location on the river, which is the site of the Yangguri River Bridge. The map includes labels for various towns, roads, and landmarks. The river is shown in blue, and the surrounding area is in light green. The map is oriented with North at the top.



3. TEST SYSTEM CONFIGURATION

3.1 Operation environment

	Temperature	Humidity	Pressure
10m chamber :	19° C	45%	991hPa
Shielded room :	23° C	54 %	992hPa

3.2 Measurement uncertainty

All measurements involve certain levels of uncertainties, specially in field of EMC.

The factors contributing to uncertainties are test receiver, Cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna Frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability.

Based on NIS 80,81, The measurement uncertainty level with a 95% confidence level were applied.

3.3 Sample calculation

Radiated emission

The field strength is calculated by adding the antenna Factor, cable loss and, Antenna pad subtracting the amplifier gain from the measured reading.

The sample calculation is as follows :

$$FS = MR + AF + CL + AT - AG$$

MR = Meter Reading

AF = Antenna Factor

CL = Cable Loss

AT = Antenna Pad

AG=Amplifier Gain

If MR is 30dB, AF 12dB, CL 5dB, AP 10dB, AG 35dB

The result (MR) is

$$30 + 12 + 5 + 10 - 35 = 22\text{dBuV/m}$$

4. Description of e.u.t.

4.1 Product description

Type of product :	MP3 PLAYER
Model no. :	CA-1000
Serial number :	N/A
Electric rating :	DC 1.5V
General description :	This EUT(Equipment under test) is the MP3 PLAYER.

4.2 Peripherals

Description	Manufacturer	Model / Part #	Serial number
PC	Commaeul	Emachines/j	50010 804 00808
Earphone	N/A	N/A	N/A
Monitor	Samsung electronics. Co., Ltd.	CDP15S	P041H8WKA17397
Printer	HP	C64247A	CN13V1B1SZ
Mouse	Microsoft	63618-OEM	X05-53748
Keyboard	TriGem computer Co., Ltd.	Power keyboard TRI-270	108018373
Earphone	N/A	N/A	N/A
Mic	N/A	N/A	N/A

4.3 Used cables

Cable type	Shield	Length (meters)	Connector	Connection point 1	Connection point 2
Earphone	No	1.0	P-jack	EUT	-
USB	Yes	1.0	Usb	PC	-

4.4 Operating conditions

Operating : data download mode

5. TEST RESULTS

5.1 Conducted emission

5.1.1 Measurement procedure

Mains

The measurements were performed in a shielded room.

EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.

The rear of tabletop was located 0.4m to the vertical conducted plane.

All other surfaces of tabletop was at least 0.8m from any other grounded conducting surface.

I/O cables and AC cables that were connected to the peripherals were bundled in center.

They were folded back and forth forming a bundle 0.3m to 0.4m long and were hanged at a 0.4m height to the ground plane.

Each EUT power lead, except ground (safety) lead, were individually connected through a LISN to input power source.

Both lines of power cord, hot and neutral, were measured.

5.1.2 Used equipment

Equipment	Model	Serial no.	Makers	Next cal.date	Used
Test receiver	ESC S30	100022	R&S	2003. 3. 25	x
L.I.S.N.	ESH3-Z5	827246/008	R&S	2003. 3. 12	x
	ESH3-Z5	831887/018	R&S	2003. 3. 12	
Shield room	8 × 6 × 3.3m/H	-	Daehan shield Engineering	-	x

5.1.3 Measurement uncertainty

Conducted emission measurement : ± 2.4 (K=2)

5.1.4 Test data

Frequency	Tested	LISN	Meter			Results		Limits	
Range	Freq.	Pol.	Reading[A]		Loss	[A] +/- [B]			
			QP	AV	[B]	QP	AV	QP	AV
[MHz]	[MHz]		[dBuV]		[dB]	[dBuV]		[dBuV]	
0.15 - 0.5(MHz)	0.165	N	50.40	47.50	0.20	50.60	47.70	65.20	55.20
	0.204	N	48.80	44.80	1.20	50.00	46.00	63.40	53.40
	0.339	N	47.90	46.50	2.20	50.10	48.70	59.20	49.20
	0.405	N	44.10	42.60	3.20	47.30	45.80	57.80	47.80
0.5-5(MHz)	0.657	N	40.90	36.90	0.18	41.08	37.08	56.00	46.00
	1.146	N	44.20	34.40	0.19	44.39	34.59	56.00	46.00
	1.689	N	40.00	35.20	0.21	40.21	35.41	56.00	46.00
	1.959	N	43.80	36.30	0.22	44.02	36.52	56.00	46.00
5-30 (MHz)	5.740	H	38.10	33.90	0.46	38.56	34.36	60.00	50.00
	7.900	H	39.40	31.30	0.56	39.96	31.86	60.00	50.00
	10.330	H	41.70	32.90	0.65	42.35	33.55	60.00	50.00
	11.140	H	41.40	35.80	0.81	42.21	36.61	60.00	50.00
	17.690	H	40.20	37.40	1.10	41.30	38.50	60.00	50.00

5.1.5 Result

PASS

5.2 Radiated emission

5.2.1 Measurement procedure

A pretest was performed at 3m distance in an semi-anechoic chamber for searching correct frequency.

The final test was done at a 10m chamber with a quasi-peak detector.

EUT was placed on a non-metallic table height of 0.8m above the reference ground plane.

Cables connected to EUT were fixed to cause maximum emission. Test was made with the antenna positioned in both the horizontal and vertical planes of polarization.

The measurement antenna was varied in height above the conducting ground plane to obtain the maximum signal strength.

5.2.2 Used equipment

Equipment	Model	Serial no.	Makers	Next cal.date	Used
Test Receiver	ESMI	R&S	826210/007	2003.03.08	
	ESCS30	R&S	830986/015	2003.03.18.	x
Biconical Antenna	VHA9103	Schwarzbeck	1950	2003.04.17	x
Log-Periodic Antenna	UHALP9108-A1	Schwarzbeck	0393	2003.04.17	x
Antenna Mast	MA240	HD	N/A	-	x
Turn Table	DT430S	HD	N/A	-	x

5.2.3 Measurement uncertainty

Radiated emission measurement :

30-300MHz +3.96dB / -4.04dB

300-1000MHz +3.04dB / -3.00dB

5.2.4 Test data

Tested frequency	Reading [A]	ANT	Antenna factor [B]	Cable loss [C]	Result [A+B+C]	Limit [D]	Margin [D]-[A+B]
(MHz)	(dBuV/m)	Pol.	(dB)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)
153.56	15.40	H	14.99	2.40	32.79	43.50	10.71
163.98	14.80	H	15.59	2.50	32.89	43.50	10.61
175.14	14.10	H	15.90	2.50	32.50	43.50	11.00
201.25	13.40	H	16.29	2.80	32.49	43.50	11.01
289.46	11.70	H	18.45	3.50	33.65	46.00	12.35
295.25	11.50	H	19.13	3.40	34.03	46.00	11.97
394.74	15.90	H	14.31	3.80	34.01	46.00	11.99
452.26	14.60	V	16.64	4.20	35.44	46.00	10.56
492.25	14.50	H	16.64	4.20	35.34	46.00	10.66
550.28	13.80	V	18.16	5.00	36.96	46.00	9.04
688.45	11.40	V	19.50	5.20	36.10	46.00	9.90
685.50	10.80	H	19.50	5.20	35.50	46.00	10.50
872.21	7.20	H	21.51	6.10	34.81	46.00	11.19

* Receiving Antenna Mode : *Horizontal, Vertical*

* 3m chamber

* <5 : mean less than 5dB

5.2.5 Result

PASS

6. TEST PHOTOGRAPHS

Conducted emission



Radiated emission



EUT (front)



EUT (rear)



EUT (inner)

